

**STATEMENT BY
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**Hearing on “The National Academy of Sciences’ Decadal Plan for Aeronautics:
A Blueprint for NASA?”**

**Subcommittee on Space & Aeronautics
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Introduction

Chairman Calvert, on behalf of the Aerospace Industries Association of America (AIA), I wish to thank you, Representative Udall, and the Space and Aeronautics Subcommittee for the opportunity to testify on the status of civil aeronautics research and development (R&D) at NASA. I would like to commend NASA for their commitment to the Vision for Space Exploration (VSE) and for requesting the National Academies’ study on its workforce. I am honored to serve on this panel.

As you may know, AIA represents more than 100 large companies and 170 smaller business suppliers that employ 627,000 highly skilled workers. We operate as the largest trade association in the United States across three sectors: civil aviation, space systems, and national defense. Maintaining U.S. aviation leadership is critical to our national economic health and national security. Aerospace provides our nation’s largest trade surplus (\$40 billion in 2005), while U.S. companies continue to invest heavily in R&D, spending more than \$50 billion over the last 15 years.

The United States’ federal investment in aeronautics research is at a cross roads. Around the world, governments are taking aim at our commercial aviation industry -- increasing their investment and making commercially relevant aeronautics R&D a top priority. Meanwhile, the United States continues to deemphasize non-military aeronautics research. For example, while NASA continues to downsize and internalize its aeronautics program, implementation of the European Union’s R&D plan Vision 2020 is accelerating. This trend will have a serious impact on the nation’s competitiveness, national security, and position as the world’s leader in aeronautics research. As a result, rather than leading the world in the development of next generation aviation products, services and infrastructure, the United States will take a backseat to the products created by other nations: products supported by policies, rules and incentives designed to disadvantage United States’ solutions.

The sections of my testimony, Mr. Chairman, correspond with the three questions that you posed in the witness letter of invitation.

How would you assess the Aeronautics Research Mission Directorate’s program goals and strategies? Is NASA’s emphasis on foundational research appropriate? Given the resources

currently allocated to it, is ARMD properly structured, and is it pursuing the right lines of research?

Mr. Chairman, the United States' role as the world leader in aeronautics is at risk due to sustained cuts to the NASA aeronautics budget. NASA's Aeronautics Research Mission Directorate (ARMD) budget has seen consistent cuts over the last 13 years. From a funding level of \$1.54 billion in FY1994, cuts to the ARMD budget have resulted in a more than 50% reduction, with a proposed FY2007 funding of only \$724.4 million.

This committee showed its leadership and concern for the state of aeronautics last year when it mandated in the 2006 NASA Reauthorization Act that the administration create a National Aeronautics Policy that reflects the critical role of aeronautics to U.S. long-term competitiveness. This document, scheduled to be completed by November 2006, needs to provide a framework and a roadmap that sets the path for answering the questions that this committee determined as key for the long-term future of domestic aeronautics research and not just the next budget cycle. Instead, significant cuts are being made to the ARMD before the policy is written.

Excessive decreases in funding endanger the future of U.S. leadership in the global aviation industry. The risk is compounded by NASA's redirection and internalization of planned research. If NASA is to remain at the forefront of aeronautics research, it is critical that significant changes are made to the proposed aeronautics funding levels and research plans. The recently marked-up appropriations bill cuts almost \$88 million in ARMD funding from last year's enacted level. While NASA is sustaining cuts, critical research for the Next Generation Air Transportation System (NGATS) is unfunded and missing from the work plans of any governmental agency. It is estimated that an additional \$200-300 million of transitional research is needed each year in vital areas such as air traffic modernization, environment and safety in order to implement this important multi-agency system.

With the U.S. air traffic system close to the point of gridlock, only the transformational improvements of NGATS can address capacity shortfalls and other long-term growth needs. The U.S. air transportation system and aviation industry are national assets that directly impact the U.S. economy and drive its long-term growth. They are also integral to national security. Approximately 10 percent of the U.S. economy is directly tied to aviation.

The new NASA ARMD research direction largely eliminates cutting-edge demonstration or validation activities (including X planes) that have proven both highly valuable and inspiring. Abandoning transitional R&D demonstrations removes a major tool used to validate fundamental research projects and to conduct research that cannot be performed in laboratories or on computers. Cutting-edge demonstration or validation programs are also vital for establishing the standards and regulations necessary to field many new capabilities.

NASA plays a critical role in the way Americans view our place in the world; as the world leader in space exploration, science programs and aeronautics research. These programs are far too important to be pitted against one another in annual funding battles. Increased funding for aeronautics research at NASA should not come at the expense of other important agency priorities, but from an overall NASA budget increase. In the FY2006 NASA budget, Congress took the first step in reversing the detrimental decline in ARMD funding by providing an

increase of \$60 million over the FY2006 request. We respectfully request that Congress continue to show leadership on this issue by providing at least level funding of \$912.3 million in the FY2007 NASA aeronautics budget. NASA must step up by using restored funds exclusively on transitional R&D programs with an emphasis on the prototypes and demonstrations needed to develop and implement NGATS.

What should NASA be doing to ensure that its research is relevant to the long-term needs of industry and is used by industry? What should NASA be doing to help keep the academic research enterprise healthy and to ensure an adequate supply of aeronautics engineers and researchers?

This year marks the 50th anniversary of the landmark X-1 project. This project exemplifies the inspiration and vision we need to attract America's best and brightest to aerospace careers. In addition to providing valuable applicable technical knowledge, the X-1 project defined and solidified the post-war cooperative merger between U.S. military needs, industrial capabilities, and research facilities. These are all vital elements of what should be in a national aeronautic policy.

Instead, NASA has retreated from its engagement with industry while focusing program development and execution internally – this must be reversed. NASA must fully engage its government and private sector stakeholders. For example, NASA should plan and conduct its research program in conjunction with government and private sector stakeholders to support the NGATS research needs identified by the Joint Planning and Development Office (JPDO).

Although the development of the National Aeronautics Policy is encouraging, additional collaboration is necessary to ensure that the policy meets our long-term needs. This new policy must ensure continued U.S. leadership and set the vision that lays the foundation for a healthy research enterprise and drives stable budgetary and program decisions across all federal aeronautics R&D. Rather than hosting a one-time meeting to listen to stakeholders, the administration needs to partner with academia, users, and manufacturers to create a transparent public development and review process for the policy.

The policy must be supported by robust technology roadmaps that are developed in concert with government, industry, and academia. The individual scientists and engineers in any of these areas are not in the best position to determine how, when and whether the technologies they investigate will be utilized. It takes industry and government technical leaders working together at the strategic level to determine what research should be pursued. To ensure that programs linked to tactical and strategic roadmap goals are appropriate and adequately supported, regular government stakeholder meetings to evaluate progress, goals, and means should be sponsored by each federal agency that funds aeronautics research. Ensuring a relevant role for the university community will also guarantee that new engineers and scientist graduates have skills that are relevant to their future industry and government employers.

What is your reaction to the conclusions and recommendations of the Decadal Survey?

I commend the National Academies on a well written, concise and thorough report on aeronautic research needed in the next ten years. The Aerospace Industries Association agrees with the five

common themes the study identified among the 51 high-priority research challenges. We also agree that NASA needs to create a more balanced split in the allocation of aeronautics R&D funding between in house research (performed by NASA) and external research (by industry and/or universities).

Though we commend the use of the qualified function deployment (QFD) process to rank the need and importance of R&D projects, it is essential to also define their funding needs. When using reports like this to stress the importance of federal R&D spending, without specific figures, these priorities lose importance and are harder to quantify. The QFD also ranks many aeronautic R&D challenges as low priority due to their impact on only one or two “Strategic Objectives.” Research in smaller, lighter, and less expensive avionics; more efficient certification processes; design, development, and upgrade processes for complex, software-intensive systems; and secure network-centric avionics architecture and systems all will play a part in NGATS. If NASA will not fulfill its mission directive and conduct this type of transitional research, the question becomes who will?

The American public, our national competitive standing, and industry are adversely affected by dramatic redirection of research priorities. A national policy would minimize dramatic redirecting of aeronautics research and provide industry with confidence regarding future federal research priorities for future business investment.

The National Aeronautics Policy must be consistent with the government’s historic research role and promote the continued United States leadership of civil and military aeronautics research, and pragmatically address issues of leadership, vision for the future, relevance of research, and transition from research to development. The policy should support the development and stable funding of integrated research roadmaps in advanced fixed and rotary wing aircraft and propulsion as well as the subsonic, supersonic and hypersonic fields. Industry is willing and prepared to assist the administration in the development of the national policy and subsequent research roadmaps.

Thank you once again, Mr. Chairman, for this opportunity to share the perspectives of AIA on the civil aeronautics R&D at NASA.